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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/664,436

09/17/2003

Teruo Fujii

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EXAMINER

HYUN, PAUL SANG HWA

ART UNIT

PAPER NUMBER

1797

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/664,436	Applicant(s) FUJII ET AL.	
	Examiner PAUL S. HYUN	Art Unit 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 December 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12/28/07 has been entered.

Claims 1-19 remain pending.

The amendments to the Specification filed by Applicant have been acknowledged.

Despite Applicant's arguments, the art rejections are maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims **1, 2, 4, 5, 10, 11, 13-16, 18 and 19** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. (US 5,846,396) and O'Connor et al. (US 2002/0124896 A1).

Ouellet et al. disclose a microfluidic apparatus (see Fig. 1). As shown from top to bottom in Figure 1, the apparatus comprises a channel unit 132, and a pump unit comprising two layers (a sheet-like member and a pump portion) that are positioned with respect to each other by a bonding means (see lines 55-60, col. 3). The channel unit 132 comprises a second joint surface 116, and a plurality of second channel openings to the second joint surface 116. The sheet-like member of the pump unit comprises a first joint surface in contact with the second joint surface 116 of the channel unit 132, a plurality of through-holes, and a channel network etched onto the surface of the first joint surface such that both ends of the channel network are open to the first joint surface. The pump portion of the pump unit is attached to the bottom of the sheet-like member. The reference further discloses that each unit can be made from PDMS (see line 40, col. 3), and it is well-known in the art to incorporate micropumps in such devices (see line 22, col. 12).

The device disclosed by Ouellet et al. differs from the claimed invention in that Ouellet et al. do not explicitly disclose the location of a pumping mechanism relative to the device. Ouellet et al. also do not disclose that the units are detachably joined.

With respect to the location of the pumping mechanism, Zanzucchi et al. disclose a micropump for facilitating the movement of fluid within a microfluidic channel wherein the micropump is disposed within the channel (see claim 19). In light of the disclosure of Zanzucchi et al., it would have been obvious to one of ordinary skill in the art to position the micropump disclosed by Ouellet et al. within the network of channels to optimize the pumping ability of the micropump.

With respect to the detachable joining of the units, O'Connor et al. disclose a microfluidic device constructed from layers of substrates. The layers are bonded to one another by means of a removable adhesive (see [0056]). In light of the disclosure of O'Connor et al., it would have been obvious to one of ordinary skill in the art to bond the layers of the device disclosed by Ouellet et al. using removable adhesive so that the device can be disassembled for cleaning.

Claims **3, 12 and 17** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. and O'Connor et al. as applied to claims 1, 2, 4, 5, 10, 11, 13-16, 18 and 19, and further evidenced by Wikipedia.

Neither Ouellet et al., Zanzucchi et al., nor O'Connor et al. explicitly disclose that PDMS is translucent. However, Wikipedia discloses that PDMS is optically clear.

Claims **6, 7 and 9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al.

Ouellet et al. disclose a microfluidic apparatus (see Fig. 1). As shown from top to bottom in Figure 1, the apparatus comprises a channel unit 132, a sheet-like member, and a pump unit that are positioned with respect to each other by a bonding means (see lines 55-60, col. 3). The channel unit 132 comprises a second joint surface 116, and a plurality of second channel openings to the second joint surface 116. The sheet-like member comprises a fourth joint surface in contact with the second joint surface 116, a third joint surface opposite the fourth joint surface, and a plurality of through-holes in

Art Unit: 1797

fluid communication with the second channel openings of the channel unit. Lastly, the device comprises a pump unit comprising a first joint surface in contact with the third joint surface of the sheet-like member, and a channel network etched onto the surface of the first joint surface such that both ends of the channel network are open to the first joint surface. The reference further discloses that each unit can be made from PDMS (see line 40, col. 3), and it is well-known in the art to incorporate micropumps in such devices (see line 22, col. 12).

The device disclosed by Ouellet et al. differs from the claimed invention in that Ouellet et al. do not explicitly disclose the location of a micropump relative to the device.

Zanzucchi et al. disclose a micropump for facilitating the movement of fluid within a microfluidic channel wherein the micropump is disposed within the channel (see claim 19). In light of the disclosure of Zanzucchi et al., it would have been obvious to one of ordinary skill in the art to position the micropump disclosed by Ouellet et al. within the channel to optimize the pumping ability of the micropump.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ouellet et al. in view of Zanzucchi et al. as evidenced by Wikipedia.

Neither Ouellet et al. nor Zanzucchi et al. explicitly disclose that PDMS is translucent. However, Wikipedia discloses that PDMS is optically clear.

Response to Arguments

Applicant's arguments with respect to the art rejections have been fully considered but they are not persuasive.

Applicant argues that the claims are patentable over the cited references because the references do not disclose that the material used for forming the substrates is an elastic material having a self-sealing feature. This argument is not persuasive. The Specification of the instant application discloses that PDMS is an example of a material that exhibits the claimed feature (see [0050]). Ouellet et al. disclose that the device shown in Figure 1 of the reference is made from PDMS (see lines 46-53, col. 3). Because elasticity and the ability to self-seal are inherent features of PDMS, the device shown in Figure 1 of Ouellet et al. must comprise and exhibit the claimed properties regardless of whether the reference explicitly discloses that PDMS comprises the claimed features. With respect to Applicant's argument that Ouellet et al. disclose that the layers of the disclosed devices are thermally bonded, the fact that the layers are thermally bonded does not negate the properties of PDMS.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAUL S. HYUN whose telephone number is (571)272-8559. The examiner can normally be reached on Monday-Friday 8AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul S Hyun/
Examiner, Art Unit 1797

/Jill A. Warden/
Supervisory Patent Examiner, Art Unit 1797